

WHAT IS CLAIMED IS:

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1. A method of fixing link time problems relating to out of range limitations in transfer of control comprising the steps of: determining if a transfer of control is beyond a near call limitation and if so generating a trampoline code for a long distance transfer of control by redirecting original call to a code which will transfer control to the original target address.
 2. The method of Claim 2 wherein if resources are a problem using a sequence of trampolines.
 3. A method of making far calls or branches comprising the step of providing link time modification of object code generated by the compiler or assembler by the addition of custom generated object code to the link without changing the compiler generated instructions or expanding compiler generated object code.
 4. A method of branch or call instructions comprising the steps of: the compiler or assembler generating near-call instructions for all external calls, and near-return instructions for all global subroutine returns, ignoring link-time layout of sections; the linker allocating all object code sections, with no need to take into account the limitations of near-branch instructions; for each near external call C, the linker computing the distance from C to its target T and performing the following

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5 steps: determining if the C and T allocated close enough to each other to permit a near call and if so, then C near-calling T directly with no modification is necessary and returning to consider the next call; otherwise if there is there already a trampoline S1 to target T that is linkably close enough to C to permit a near call, then modifying C to point to B1 in S1 and returning to consider the next call; otherwise, creating trampoline section S1 and modifying C to point to B1 in S1 and add any necessary setup code to S1 and continue with following steps of determining if a second trampoline S2 needed to reach T? and if not, then assigning B1 in S1 to contain a far call to T, and return to consider the next call; otherwise, determining if a second trampoline S2 already exists to reach T and if so, then modifying B1 in S1 to point to existing B2 in existing S2, and return to consider the next call; otherwise, creating a second trampoline S2 and modifying S1 to perform a far call to B2 in S2 and add any necessary setup code to S2 and subroutine B2 in S2 is made to contain a near call to T and return to consider the next call.

25 5. A method of fixing link time problems relating to out of range branch or call instructions comprising the steps of: generating near calls at the compiler or assembler for all external branches or calls; determining if the target is too distant from a call or branch; and if too far distant generating a trampoline section to the target and

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re-directing the near call or branch to the trampoline section.

6. The method of Claim 5 including the step of returning to an original call by returning the control through the trampoline section

7. A method of fixing link time problems relating to out of range branch or call instructions comprising the steps of: computing if the target is too far distant from the branch or call; if too far distant determining if there already is a trampoline section to the target and if so redirect the new call or branch to that trampoline section and if not already a trampoline to the target generating a trampoline section to the target and redirect the near call or branch to the generated trampoline section.

8. The method of Claim 7 where if a single-trampoline fails to work because of resources the step of generating a second trampoline and generating a far branch or call from said first trampoline to the second trampoline section and generating at the second trampoline section a near call or branch to the original target.

9. The method of Claim 8 wherein the return is a near return from the target to the second trampoline, a far return from the second trampoline, and a near return from the first trampoline to the original call.